

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Cancelled)
2. (Currently Amended) The transformant according to claim 11, wherein the genes ~~each~~ encoding a subunit of glycerol dehydratase and/or diol dehydratase are ~~derived~~ from *Lactobacillus reuteri*.
3. (Currently Amended) The transformant according to claim 11; wherein ~~which comprises~~ the gene encoding propanol dehydrogenase is a gene encoding 1,3-propanediol oxidoreductase ~~and said gene is derived~~ from *Lactobacillus reuteri*.
4. (Currently Amended) The transformant according to claim 11, ~~which comprises~~ wherein the gene encoding propanol dehydrogenase 1,3-propanediol oxidoreductase ~~and said gene is derived~~ from *Lactobacillus reuteri*.
5. (Currently Amended) The transformant according to claim 11, wherein the genes encoding the subunits ~~each encoding a subunit~~ of the reactivation factor for glycerol dehydratase and/or ~~the reactivation factor~~ for diol dehydratase are ~~derived~~ from *Lactobacillus reuteri*.
6. (Currently Amended) The transformant according to claim 11, ~~wherein the genes~~ encoding aldehyde dehydrogenase ~~are genes encoding propionaldehyde dehydrogenase, and said transformant further comprises the genes~~ further comprising a gene encoding

phosphotransacylase ~~the genes and a gene~~ encoding propionate kinase, but ~~does not comprise~~ any gene encoding glycerol dehydrogenase.

7. (Original) The transformant according to claim 6, which comprises the pdu operon, ~~and no gene encoding glycerol dehydrogenase.~~

8. (Currently Amended) Knockout bacteria of *Lactobacillus reuteri* lacking glycerol dehydrogenase activity, which are obtained by knocking out the gene encoding glycerol dehydrogenase, ~~from bacteria of the genera *Lactobacillus*, *Salmonella*, *Klebsiella*, *Listeria*, *Clostridium*, *Escherichia*, *Enterobacter*, *Caloramator*, *Acetobacterium*, *Brucella*, *Flavobacterium*, *Fusobacterium*, *Citrobacter*, or *Propionibacterium*.~~

9. (Currently Amended) Knockout bacteria of *Lactobacillus reuteri* comprising the pdu operon and the a gene encoding phosphotransacylase, wherein but not the gene encoding glycerol dehydrogenase, is knocked out.

10. (Currently Amended) A method for producing 1,3-propanediol and/or 3-hydroxypropionic acid by comprising:

- (a) ~~bringing obtaining~~ the transformants ~~or bacteria~~ according to ~~any one of claims claim 11, to 9~~ into contact with glycerol,
- (b) culturing the transformant in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and/or 3-hydroxypropionic acid.

11. (New) A transformant of *E. coli* or *Lactobacillus reuteri* comprising genes encoding:  
large, medium, and small subunits of glycerol dehydratase and/or large, medium, and small  
subunits of diol dehydratase;  
large and small subunits of a reactivation factor for glycerol dehydratase and/or large and small  
subunits of a reactivation factor for diol dehydratase;  
propionaldehyde dehydrogenase; and  
propanol dehydrogenase.

12. (New) A method for producing 1,3-propanediol and/or 3-hydroxypropionic acid  
comprising:

- (a) obtaining the knockout bacteria of claim 8,
- (b) culturing the knockout bacteria in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and/or 3-hydroxypropionic acid.

13. (New) A method for producing 1,3-propanediol and/or 3-hydroxypropionic acid  
comprising:

- (a) obtaining the knockout bacteria of claim 9,
- (b) culturing the bacteria in the presence of glycerol, and
- (c) purifying the 1,3-propanediol and/or 3-hydroxypropionic acid.

14. (New) The transformant according to claim 11,  
wherein the gene encoding the large subunit of glycerol dehydratase encodes the following  
protein (a) or (b):

(a) a protein comprising an amino acid sequence as shown in SEQ ID NO: 1 or 3, or

(b) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 1 or 3 by deletion, substitution, or addition of one or 2-3 amino acid residues and having glycerol dehydratase activity when expressed with the medium and small subunits of glycerol dehydratase;

wherein the gene encoding the medium subunit of glycerol dehydratase encodes the following protein (c) or (d):

(c) a protein comprising an amino acid sequence as shown in SEQ ID NO: 5 or 7, or

(d) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 5 or 7 by deletion, substitution, or addition of one or 2-3 amino acid residues and having glycerol dehydratase activity when expressed with the large and small subunits of glycerol dehydratase; and

wherein the gene encoding the small subunit of glycerol dehydratase encodes the following protein (e) or (f):

(e) a protein comprising an amino acid sequence as shown in SEQ ID NO: 9 or 11, or

(f) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 9 or 11 by deletion, substitution, or addition of one or 2-3 amino acid residues and having glycerol dehydratase activity when expressed with the large and medium subunits of glycerol dehydratase.

15. (New) The transformant according to claim 11,

wherein the gene encoding the large subunit of glycerol dehydratase comprises a nucleotide sequence as shown in SEQ ID NO: 2 or 4 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 2 or 4;

wherein the gene encoding the medium subunit of glycerol dehydratase comprises a nucleotide sequence as shown in SEQ ID NO: 6 or 8 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 6 or 8; and

wherein the gene encoding the small subunit of glycerol dehydratase comprises a nucleotide sequence as shown in SEQ ID NO: 10 or 12 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 10 or 12.

16. (New) The transformant according to claim 11, wherein the gene encoding propanol dehydrogenase encodes the following protein (a) or (b):

(a) a protein comprising the amino acid sequence as shown in SEQ ID NO: 13 or 15; or

(b) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 13 or 15 by deletion, substitution, or addition of one or 2-3 amino acid residues and having propanol dehydrogenase activity.

17. (New) The transformant according to claim 11, wherein the gene encoding propanol dehydrogenase comprises a nucleotide sequence as shown in SEQ ID NO: 14 or 16 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 14 or 16.

18. (New) The transformant according to claim 11,

wherein the gene encoding propanol dehydrogenase is a gene encoding 1,3-propanediol oxidoreductase that encodes the following protein (a) or (b):

- (a) a protein comprising an amino acid sequence as shown in SEQ ID NO: 17; or
- (b) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 17 by deletion, substitution, or addition of one or 2-3 amino acid residues and having 1,3-propanediol oxidoreductase activity.

19. (New) The transformant according to claim 11,

wherein the gene encoding propanol dehydrogenase is a gene encoding 1,3-propanediol oxidoreductase comprising a nucleotide sequence as shown in SEQ ID NO: 18 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 18.

20. (New) The transformant according to claim 11,

wherein the gene encoding the large subunit of the reactivation factor for glycerol dehydratase encodes the following protein (a) or (b):

- (a) a protein comprising an amino acid sequence as shown in SEQ ID NO: 19 or 21; or
- (b) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 19 or 21 by deletion, substitution, or addition of one or 2-3 amino acid residues and having the activity of the reactivation factor for glycerol dehydratase when expressed with the small subunit of the reactivation factor for glycerol dehydratase, and

wherein the gene encoding the small subunit of the reactivation factor for glycerol dehydratase encodes the following protein (c) or (d):

- (c) a protein comprising an amino acid sequence as shown in SEQ ID NO: 23 or 25; or
- (d) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 23 or 25 by deletion, substitution, or addition of one or 2-3 amino acid residues and having the activity of the reactivation factor for glycerol dehydratase when expressed with the large subunit of the reactivation factor for glycerol dehydratase.

21. (New) The transformant according to claim 11,  
wherein the gene encoding the large subunit of the reactivation factor for glycerol dehydratase comprises a nucleotide sequence as shown in SEQ ID NO: 20 or 22 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 20 or 22; and  
wherein the gene encoding the small subunit of the reactivation factor for glycerol dehydratase comprises a nucleotide sequence as shown in SEQ ID NO: 24 or 26 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 24 or 26.

22. (New) The transformant according to claim 11,  
wherein the gene encoding propionaldehyde dehydrogenase encodes the following protein (a) or (b):

- (a) a protein comprising an amino acid sequence as shown in SEQ ID NO: 41; or

(b) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 41 by deletion, substitution, or addition of one or 2-3 amino acid residues and having propionaldehyde dehydrogenase activity.

23. (New) The transformant according to claim 11, wherein the gene encoding propionaldehyde dehydrogenase comprises a nucleotide sequence as shown in SEQ ID NO: 42 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 42.

24. (New) The transformant according to claim 6, wherein the gene encoding propionate kinase encodes the following protein (a) or (b):  
(a) a protein comprising an amino acid sequence as shown in SEQ ID NO: 43; or  
(b) a protein comprising an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 43 by deletion, substitution, or addition of one or 2-3 amino acid residues and having propionate kinase activity.

25. (New) The transformant according to claim 6, wherein the gene encoding propionate kinase comprises a nucleotide sequence as shown in SEQ ID NO: 44 or a nucleotide sequence that hybridizes under stringent conditions to a complement of SEQ ID NO: 44.